

Advanced Microgravity Compatible, Integrated Laundry System, Phase I

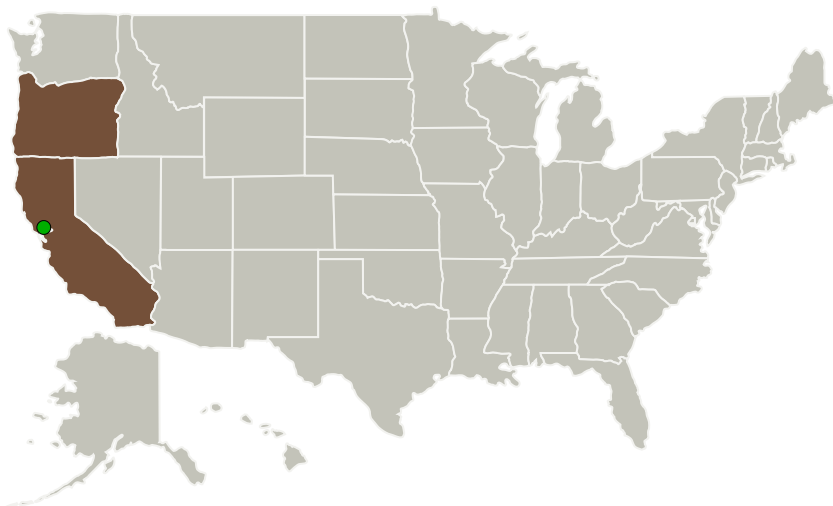
Completed Technology Project (2012 - 2012)



Project Introduction

The Advanced Microgravity Compatible, Integrated Laundry (AMCIL) is a microgravity compatible liquid / liquid vapor, two-phase laundry system with water jet agitation and vacuum assisted drying. Umpqua Research Company previously developed a complete microgravity compatible Single Phase Laundry System (SPLS). Single-phase operation during the wash cycle facilitated microgravity compatible fluidics and eliminated problems associated with foams. Pulsed water jets were utilized to agitate the clothing. Drying was achieved with microwave assisted vacuum drying followed by a tumble cycle that greatly enhanced softness in the previously vacuum pressed clothing. Tumbling was achieved by an array of three air jets, two to generate a cyclonic effect and a third to induce tumbling by blowing perpendicular to the plane of rotation. This concept was successfully demonstrated during a KC-135 microgravity simulation flight. The proposed AMCIL concept will build on the SPLS technology and incorporate key design improvements to reduced water requirements and lower power consumption. Specific advancements include a redesigned wash cycle that consumes less water and reduces power demand. The Phase I effort will demonstrate the feasibility of the microgravity compatible liquid / liquid vapor, two-phase washing concept in a laboratory scale system. A complete, automated prototype unit that incorporates the system parameters established during the Phase I tests will be designed, fabricated, and tested during the Phase II program.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
UMPQUA Research Company	Lead Organization	Industry	Myrtle Creek, Oregon
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Oregon

Project Transitions

▶ **February 2012:** Project Start

✓ **August 2012:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140308>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

UMPQUA Research Company

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

William F Michalek

Co-Investigator:

William Michalek

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Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.1 Environmental Control & Life Support Systems (ECLSS) and Habitation Systems
 - └ TX06.1.4 Habitation Systems

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System